

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Torborg et al.

Group Art Unit: 1712

Serial #: 09/724,493

Examiner: Margaret G. Moore

Filed: November 28, 2000

Attorney Docket No.: EE-083-US-01

Title: Low Gloss Powder Coating Compositions

MS: Amendment

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

DECLARATION UNDER 37 CFR 1.131

Charles Torborg and Jeffrey Schmierer declare:

1. that they are the applicants of the above-identified application
2. The invention claimed in the above-identified application was jointly conceived and reduced to practice in the United States of America prior to August 21, 2000, as indicated by the following facts, supported by the attached Exhibit 1.
3. All of the work described in Exhibit 1 was performed at H.B. Fuller Company, St. Paul, Minnesota, U.S.A., prior to August 21, 2000.
4. Exhibit 1 is a copy of H.B. Fuller Confidential Invention Disclosure entitled "Reduced Gloss Low Cure Acrylic Powder Coating", which contains a record of some of the early work on the low gloss coating by Charles Torborg, one of the declarants herein. The dates recorded on these documents have been blocked and are considered confidential at this point in time.
5. The Invention Disclosure describes the low gloss powder coating composition that includes two components dry blended together prior to the application. The first

component (a) includes (i) at least one glycidyl group-containing acrylic resin having epoxide equivalent weight of from about 250 to about 1500 and glass transition temperature of from about 30° C to about 80° C; and (ii) a curing agent chosen from dicarboxylic acids, dicarboxylic acid anhydrides and mixtures thereof. The second component (b) includes at least one carboxyl-group containing material that has an acid number of from about 10 to about 300 and that is not substantially compatible with the first component.

6. that all statements made herein of their own knowledge are true and that all statements made on information and belief are believed to be true; and further that statements are made with the knowledge that willful and false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 1/27/05

Charles Torborg 

Date: 02/03/05

Jeffrey Schmierer 



Exhibit 1



FORM A

Received
H.B. Fuller Company
Patent Dept.
CONFIDENTIAL INVENTION DISCLOSURE

Disclosure #: (Patent Dept will fill in)	99-083	Page <u>1</u> of <u>28</u>
Originating Unit: Specialty Group - Global Coatings Division		
Title: Reduced Gloss Low Cure Acrylic Powder Coating		
Technology Area: <input type="checkbox"/> Waterbase <input type="checkbox"/> Hot Melt <input checked="" type="checkbox"/> Thermoset/Other		
Other Interested Departments / Business Units: Woodworking		

- Include: *(Use attached pages for the following descriptions - inventor sign each page)*
- 1) Short description of the invention.
 - 2) Describe the utility of the invention, including the difference(s) and advantage(s) over previous approaches.
 - 3) Provide examples which illustrate the invention by attachment of notebook pages.
 - 4) Identify all people (inventors) who have contributed to this invention.
 - 5) List and attach any other relevant information such as patent and literature searches, internal reports, drawings, etc.
 - 6) Is this invention potentially a trade secret?
- Send: - Original Form A to Patent Department
 - Copy of Form A and Form B to Dept Head

Described by: (Print or type name)	Read & Understood by: (Print or type name of <u>witness</u>)
<u>CHARLES TORBORG</u>	<u>Christine Griesse</u>
Signature	Signature
<u>Charles Torborg</u>	<u>Christine Griesse</u>
Date	

CONFIDENTIAL DOCUMENT OF
H.B. FULLER CO.
ST. PAUL, MINN.

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INVENTION DISCLOSURE DESCRIPTION

1) In the present invention catalyzed polyester particles are dry blended with a low cure glycidyl methacrylate (GMA) powder coating. The resulting powder mixture yields a cured film with excellent smoothness and a 60° gloss as low as 20. The gloss can be controlled by the amount of polyester used.

2) Epoxy functional acrylic powder coatings have been known for their outstanding smoothness and weathering resistance. Mitsui Chemicals, Inc describes in EP 0849340A2 an acrylic powder composition that includes tin catalysts and can be cured from 120 to 160 °C for 10 to 60 minutes. The cured coatings are high gloss (60° gloss = 60 to 100). Traditionally it has been difficult to lower the gloss of these coatings without sacrificing considerable smoothness. The advantage of this invention is that it offers a low cure acrylic coating in which the gloss can be adjusted without a significant impact on smoothness and physical properties.

The described invention is very well suited as a coating for heat sensitive substrates such as wood, wood composites and plastics.

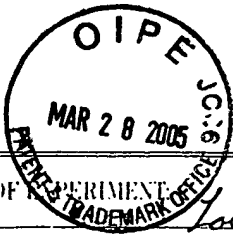
3) See pages 5 - 8, 10 - 13 and 28 of notebook # 6851 attached.

4) Inventor: Chuck Torborg

5) EP 0849340 A2

6) This invention is a potential trade secret.

Described by: (Print or type name)	Read & Understood by: (Print or type name of witness)
<u>CHARLES TORBORG</u>	<u>Christine Griesse</u>
Signature	Signature
<u>Charles Torborg</u>	<u>Christine Griesse</u>
Date	Date



H.B. Fuller Company

RESEARCH NOTEBOOK
CONFIDENTIAL

BOOK 6

PAGE 5

TITLE OF EXPERIMENT

Lower glass acrylic

DATE

LABORATORY LOCATION

PROJECT NO.

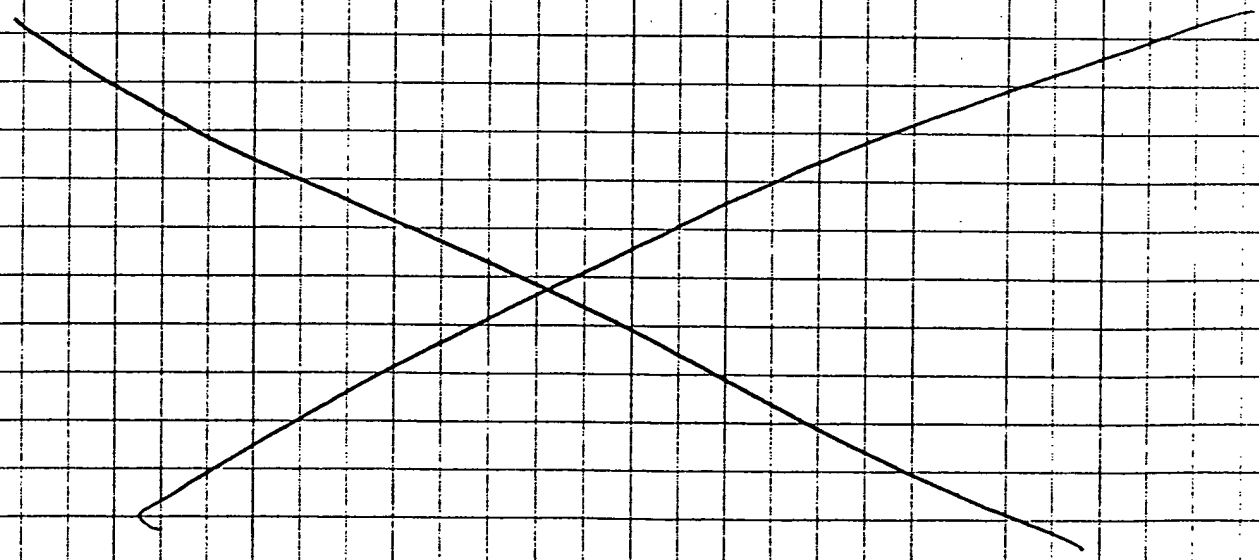
OBJECTIVE OF EXPERIMENT

6851	5A	5B	5C	5D	5E
PD-3402	69.5	68.75	70.75	68.75	75.5
ADDITOL UYL 1381	30.5	31.25	29.25	31.25	24.5
PG7 HBF	1.5	1.5	1.5	1.5	1.5
URAFLOW B	0.5	0.5	0.5	0.5	0.5
OCTAFLOW ST-70	2.0	2.0	2.0	2.0	2.0
CAB-051L TS-720	—	2.0	—	5.0	—

↑ STOICED FOR 100pts ^{90 10} 5700/831 per hour
 ↑ STOICED FOR 30pts ^{90 10} 5700/831 per hour

CAB-051L TS-720 -
 6851 - 5B: 79.6 glass at 5 mils
 6851 - 5D: 65.7 glass at 5 mils - heavy orange peel
 Cabosol does little to lower the glass but increases orange
 peel dramatically.

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BOOK 6851



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PAGE 6

TITLE OF EXPERIMENT

Catalyzed polyester for Acrylic dryblend

DATE:

LABORATORY LOCATION:

PROJECT NO.:

OBJECTIVE OF EXPERIMENT

6851	6A		
P5700	90		
B31	10		
The following mixtures were dryblend together, coated on a 3/4" MDF panel preheated at 325°F for 10 minutes and cured at 325°F for 10 minutes:			
80% 6851-SA	"OVERSTOVED"	60° gloss & 5 mils 52.8	SOMEX double rule no sub off
20% 6851-6A			
70% 6851-SC	"OVERSTOVED"	43.4	no sub off
30% 6851-6A			
6851-4A (for comparison)		81.1	
100pts 6851-SA		69.6	no sub off
10pts 6851-6A			
100pts 6851-SC		46.6	no sub off
30pts 6851-6A			
100pts 6851-SC		45.7	moderate sub off - tacky
27pts P5700			
100pts 6851-4A		71.2	no sub off
3pts B-31			
100pts 6851-SE		29.6	moderate sub off
100pts 6851-6A			

The above data indicate that it is the polyester that lowers the gloss but the B-31 improves MEK resistance. Blagany was the manufacturer of the MDF.

CHEMIST

Charles Toring

DATE:

Christine Gies

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TITLE OF EXPERIMENT:

White reduced glass acrylic dryblend

DATE:

LABORATORY LOCATION:

PROJECT NO.:

OBJECTIVE OF EXPERIMENT:

6851	7A	7B
PD-3402	70.75	-
ADDITOL (XCL 1381)	27.25	-
RESIFLOW P67H8F	1.5	-
URAFLOW B	0.5	-
OCTIFLOW ST-7D	2.0	-
RCL-2	25	25
URALAC P 5700	-	90
B-31	-	10

100pts. of 6851-7A were dryblended with 30pts 6851-7B. The blend was coated on a 3/4" preheated (10min/325°F) MDF panel and cured for 10 minutes at 325°F. The resulting coating had moderate orange peel and at 60° gloss of 44 at 5 mils.

CHEMIST:

Charles Fortney

DATE:

Christine Gies

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TITLE OF EXPERIMENT

Low gloss clear

DATE:

LABORATORY LOCATION:

PROJECT NO.:

OBJECTIVE OF EXPERIMENT:

6851	8A	8B	8C
PD-3402	72.75	73.75	71.75
AOPITOL VXL 1381	27.75	26.25	28.25
PG7-HBF	1.5	1.5	1.5
URAFLow B	0.5	0.5	0.5
OCTAFLow ST-70	2.0	2.0	2.0

The following dryblends were coated on preheated (10mm, 325°F) $\frac{3}{4}$ " MDF supplied by Walasnite. The coatings were cured at 325°F for 10 minutes.

100pts 6851-8A

60° gloss at 5mils
28.250 MBK double rub
moderate rub off

50 pts 6851-6A

100pts 6851-8B

24.6

moderate rub off

75pts 6851-6A

100pts 6851-8C

47.3

slight Rub off

40pts 6851-6A

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Charles T. Tracy

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TITLE OF EXPERIMENT:

Catalyst Level in Polyester Acrylic Dryblend

DATE:

LABORATORY LOCATION:

PROJECT NO.:

OBJECTIVE OF EXPERIMENT:

6851	10A	10B	10C
RALAC P5700	95	90	80
8-31	5	10	20

6851-SC was formulated for 27 parts p5700 per hundred parts of EMA/ADP/100.

$100/104.2 = 0.9597$ $0.9597 \times 27 = 25.9$

Had 25.9 pts P5700 per 100 pts 6851-SC

10A = 95% P5700 $25.9/0.95 = 27.28$

27.28 pts 10A / 100 pts SC

10B = 90% P5700 $25.9/0.90 = 28.8$

28.8 pts 10B / 100 pts SC

10C = 80% P5700 $25.9/0.80 = 32.4$

32.4 pts 10C / 100 pts SC

60' glass at 5 mills

50 MEK double sub

10A/SC

46.3

moderate sub off

10B/SC

44.8

very slight sub off

10C/SC

41.6

moderate sub off

CHEMIST:

Charles T. Borg

DATE:

Christina Hines



TITLE OF EXPERIMENT:

Evaluation of Several Polyesters in the Neptole

DATE:

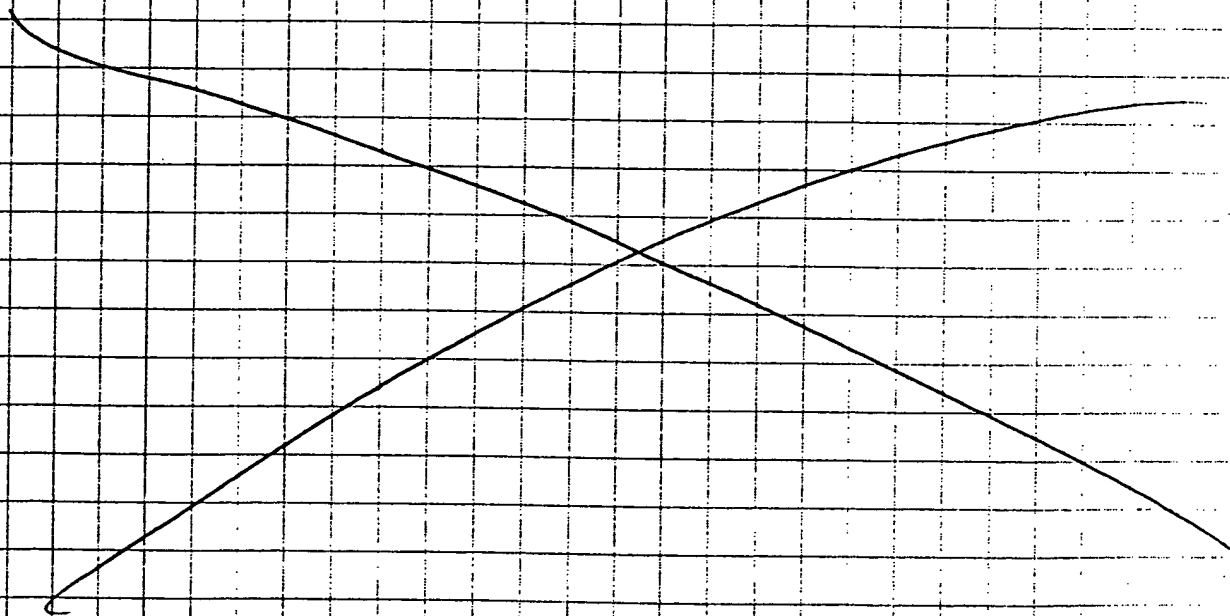
LABORATORY LOCATION:

PROJECT NO.:

OBJECTIVE OF EXPERIMENT:

The following resins were individually ground and sifted through a 100 mesh screen. Each resin was blended with 6851-SC in a ratio of 100 pts 6851-SC to 25 pts polyester resin. The mixtures were coated on preheated $\frac{3}{4}$ " ADPF (10 min / 325°F) and cured at 325°F for 10 min.

	<u>LO LOSS @ 5 mils</u>
<i>Unalac P-5700 (TALL-LOW CURE)</i>	37.2
<i>Crylocast 440 (TALL)</i>	40.9
<i>Crylocast 340 (HYBRID)</i>	22.8
<i>Crylocast 630 (TALL-SUPER DURABLE-HIGH FLOW)</i>	38.7
<i>Crylocast 2988 (HYBRID-SUPER DURABLE)</i>	48.3
<i>Sublata 7206 (HYBRID-LOW CURE)</i>	28.6



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Charles Tabor

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TITLE OF EXPERIMENT:

DATE:

LABORATORY LOCATION:

PROJECT NO.:

OBJECTIVE OF EXPERIMENT:

6851	12A	12B	12C
CRYLCOAT 340	90	-	-
B-31	10	-	-
PD-3402	70 CF	70	72.75
ADIPIC ACID 1381	30	30	27.25
PBT-HBE	1.5	1.5	1.5
URAFLON B	0.5	0.5	0.5
OCTAFLON ST-70	2.0	2.0	2.0

dryblends	gloss at 5 mils	50 MEK DR
100pts 6851-12B	54.5	slight sub off
100pts 6851-12A		
100pts 6851-12C	52.3	moderate sub off
30pts 6851-12A		
100pts 6851-12C	36	slight sub off
27pts CRYLCOAT 340		

The above results are surprising. It looks like the catalyst B-31 causes the gloss to increase

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PAGE 13

TITLE OF EXPERIMENT:

DATE:

LABORATORY LOCATION:

PROJECT NO.:

OBJECTIVE OF EXPERIMENT:

	13A ^{51% STAIN}	13B ^{100% STAIN}	13C ^{200% STAIN}	13D ^{STOCKED FOR 20PTS CRYLcoat 340}
6851				
CRYLcoat 340	95.5	91.5	84.5	—
B-31	4.5	8.5	15.5	—
PD-3402				72
ADDITIONAL VXL 1381				29.5
PL7 HBF				1.0
VRAFLOW B				25 CT
ST-70				20.5
				2.0

The following dryblends were coated on preheated (10min, 325°F) MDF and Cured at 325°F for 10 minutes.

	LOG LOSS @ 4mils	50 MEK DOUBLE RUB
20pts 6851-13A } 100pts " 13D }	36.2	mod. sub-off
20pts 6851-13B } 100pts 6851-13D }	42.8	CT moderate slight sub-off
20pts 6851-13C } 100pts 6851-13D }	55.2	slight to moderate sub-off
20pts CRYLcoat 340 } 100pts 6851-13D }	32.3	

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TITLE OF EXPERIMENT:

DATE:

LABORATORY LOCATION:

PROJECT NO.:

OBJECTIVE OF EXPERIMENT:

6851	28A	28B
Cruc coat 340	95.0	—
ST-70	5.0	5.0
P-5700		95.0

Samples were dryblended using 100 pts of 6851-27A and 20 parts of one of the samples above.

	60° gloss	50 MGE ROLLER RUBS
28A/27A	15.1	Moderate rub off
28B/27A	30.4	slight to moderate rub off
13B/27A	42.5	" " " "

13B or 6851-13B → 91 spts P-5700, 8 spts B-31

As sample of 100pts 6851-27B, 20pts 6851-28B and 2pts Alonal 2010 were dryblended, and coated on MDF to yield a smooth metallic with a 41 gloss.

CHEMIST:

Charles Tabor

DATE:

Christina

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